

AI Experimental Course

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1 Search

1.1 Uninformed Search

- DFS
- BFS
- Dijkstras Algorithm (Uniform Cost Search)

1.2 Informed (Heuristic) Search

- Greedy best-first search
- A*

You can refer to <https://www.redblobgames.com/pathfinding/a-star/introduction.html>

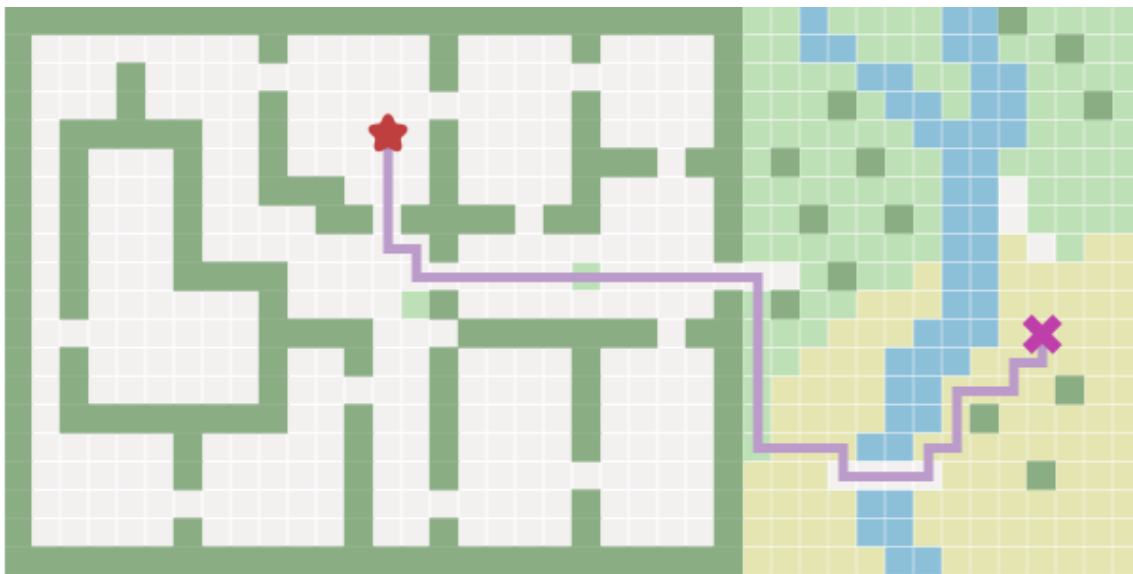


Figure 1: Path Finding by A*

1.3 Adversarial Search

- The minimax algorithm
- $\alpha - \beta$ pruning

1.4 Constraint Satisfaction Problems (CSPs)

- Backtracking Search for CSPs
- Forward Checking (FC)
- Generalized Arc Consistency (GAC)

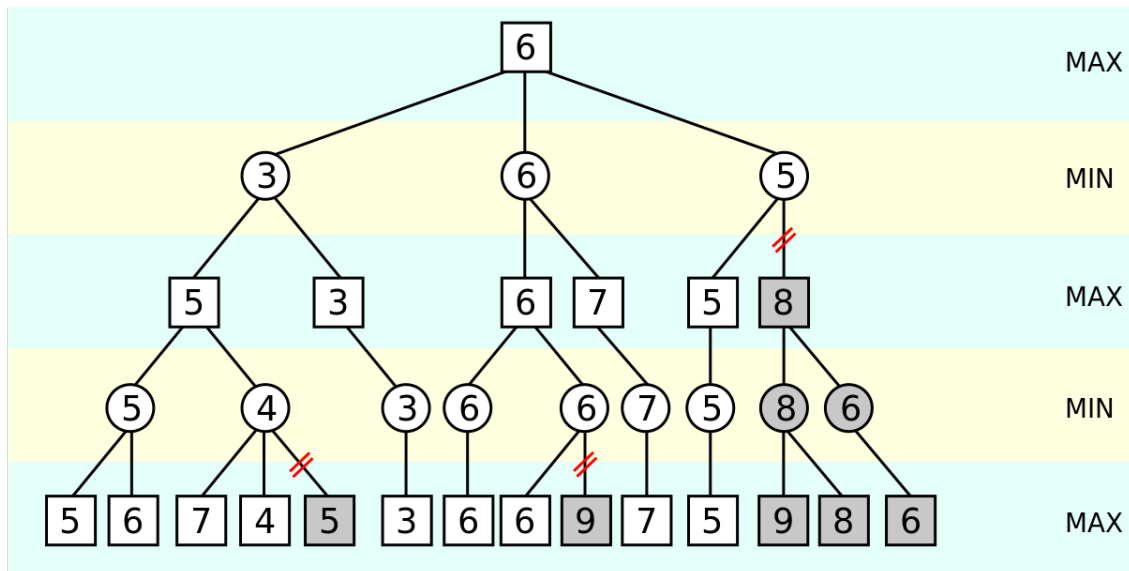


Figure 2: $\alpha - \beta$ pruning

1.5 Typical Problems

- Maze Problem
- TSP Problem
- Tic and Toe Game
- Reversed Othello Game
- Pacman Game
- Eight Queens Problem
- Sudoku Problem

2 Prolog

2.1 Typical Problems

- Search Problems
- KR (e.g. Family Problem)
- CSPs
 - Sudoku Problem
 - Eight Queens Problem
 - Other Games
- Queries on KB (Similar to SQL)

3 FF Planning System

3.1 Typical Problems

- Blocks Problem
- Logistic Problem
- 8-puzzle Problem
- Freecell Game
- Boxman Game



Figure 3: Freecell Game

4 Machine Learning

4.1 Typical Algorithms

- Probabilistic Reasoning (Bayesian Network)
- Decision Tree (ID3 Algorithm)
- Naive Bayes
- EM Clustering
- BP-Neural Network
- Deep Learning
- Reinforcement Learning